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UNITED STATES DISTRICT COURT

DISTRICT OF OREGON

PENDLETON DIVISION

OREGON FIREARMS FEDERATION, INC.,  
et al.,

Plaintiffs,

v.

TINA KOTEK, et al.,

Defendants,

and

Case No. 2:22-cv-01815-IM (lead case)  
3:22-cv-01859-IM (trailing case)  
3:22-cv-01862-IM (trailing case)  
3:22-cv-01869-IM (trailing case)

**DECLARATION OF DR. MICHAEL  
SIEGEL**

OREGON ALLIANCE FOR GUN SAFETY,	
	Intervenor-Defendant.
<hr/>	
MARK FITZ, et al.,	
	Plaintiffs,
v.	
ELLEN F. ROSENBLUM, et al.,	
	Defendants.
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KATERINA B. EYRE, et al.,	
	Plaintiffs,
v.	
ELLEN F. ROSENBLUM, et al.,	
	Defendants,
and	
OREGON ALLIANCE FOR GUN SAFETY,	
	Intervenor-Defendant.
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DANIEL AZZOPARDI, et al.,	
	Plaintiffs,
v.	
ELLEN F. ROSENBLUM, et al.,	
	Defendants.
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I, Dr. Michael Siegel, declare and state as follows:

1. I am over the age of 18, competent to testify to the matters contained in this declaration, and testify based on my personal knowledge and information.

2. I am a Professor in the Department of Public Health and Community Medicine at the Tufts University School of Medicine. I am also a physician trained in public health, preventive medicine, and epidemiology.

3. I have been retained by the State of Oregon defendants to render expert opinions in this case. I make this declaration on the basis of my training, professional expertise, and research.

4. I am charging a rate of \$500 per hour for work and preparation time in this case. I do not charge for actual trial testimony. A copy of my C.V. is attached to this declaration.

### **BACKGROUND AND QUALIFICATIONS**

5. I earned my medical degree from Yale University School of Medicine in 1990 and my Master's degree in Public Health from the University of California at Berkeley in 1992 with a concentration in epidemiology. I completed an internship in medicine in Pittsfield, Massachusetts in 1991, and a two-year residency in preventive medicine at the University of California at Berkeley in 1993. I served as a medical officer at the Office on Smoking and Health at the Centers for Disease Control and Prevention from 1993-1995, where I completed an epidemiology post-doctoral fellowship (the Epidemic Intelligence Service program). From 1995 through August 2021, I was an Assistant, Associate, and then Full Professor in the Department of Community Health Sciences at the Boston University School of Public Health. Since September 2021, I have been a Visiting Professor and now a Full Professor in the Department of Public Health and Community Medicine at the Tufts University School of Medicine.

6. I am an expert in the areas of epidemiology and public health, including the evaluation of public policies generally and gun violence specifically. I have conducted epidemiologic research in the fields of smoking, secondhand smoke, tobacco control, alcohol,

and firearms. I have nearly 30 years of experience in public health and epidemiologic research. I have 170 publications in peer-reviewed journals relating to these topics.

7. I am an expert in the analysis of the effectiveness of public policies in improving the public's health. Much of my research has involved the analysis of public policies intended to reduce youth and adult smoking and youth alcohol use. Over the course of the past decade, my work on evaluation of public policies has shifted to the area of gun violence prevention. I have published a total of 40 articles regarding firearms and gun violence in peer reviewed literature. Of these articles, 12 involved the analysis of the effectiveness of public policies (mainly state laws) intended to reduce gun violence. I have also published four monographs or reports regarding the effectiveness of various state laws in preventing firearm violence. The articles I have published relating to firearm violence have appeared in top peer-reviewed journals, including *JAMA Network Open*, *Injury Epidemiology*, *Preventive Medicine*, *Law and Human Behavior*, the *American Journal of Preventive Medicine*, *JAMA Pediatrics*, *Annals of Internal Medicine*, the *Journal of General Internal Medicine*, the *American Journal of Epidemiology*, and the *American Journal of Public Health*.

8. I have received four grants from the federal government or private foundations to study strategies to reduce gun violence. One of these grants was focused on examining the impact of state firearm laws on homicide rates. A second was focused on examining the impact of state firearm laws on the incidence and severity of mass public shootings.

9. I am particularly qualified to offer opinions on the research regarding the effectiveness of laws that implement restrictions on ammunition magazine capacity because I have published research that specifically addresses this issue. I was part of a research team that received a grant from the U.S. Department of Justice (the National Institute of Justice) to

investigate the impact of state firearm laws—including restrictions on ammunition magazine capacity—on the incidence and severity of mass public shootings.<sup>1</sup> I am lead author of the manuscript in which we reported the results of that research.<sup>2</sup> I am also a co-author of a monograph published by the Rockefeller Institute of Government, entitled “Policy Solutions to Address Mass Shootings,” which summarizes our research in a broader context.<sup>3</sup>

10. I am particularly qualified to offer opinions on the research regarding the effectiveness of laws that implement firearm permit requirements because I have published research that specifically addresses this issue. I am lead author or co-author of the two manuscripts in which we reported the results of that research.<sup>4</sup>

#### PURPOSE AND SUMMARY

11. In this case, I have been asked to evaluate whether, in my opinion, (a) state laws that restrict the capacity of ammunition magazines to 10 or fewer rounds are effective in reducing firearm violence in the setting of mass public shootings;<sup>5</sup> (b) state laws that require state permits for the purchase or possession of a gun are effective in reducing firearm violence;

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<sup>1</sup> National Institute of Justice grant #2018-75-CX-0025.

<sup>2</sup> Siegel M, Goder-Reiser M, Duwe G, Rocque M, Fox JA, Fridel EE. The Relation Between State Gun Laws and the Incidence and Severity of Mass Public Shootings in the United States, 1976–2018. *Law and Human Behavior* 2020; 44(5):347-360.

<sup>3</sup> Rocque M, Duwe G, Siegel M, Fox JA, Goder-Reiser M, Fridel EE. *Policy Brief: Policy Solutions to Address Mass Shootings*. Albany, New York: Rockefeller Institute of Government; August 2021. <https://rockinst.org/wp-content/uploads/2021/08/policy-solutions-public-mass-shootings.pdf>.

<sup>4</sup> Knopov A, Rothman EF, Cronin SW, Xuan Z, Siegel M, Hemenway D. Impact of state firearm laws on homicide rates among the Black and White populations in the United States, 1991-2016. *Health and Social Work* 2019; 44(4):232-240. <https://academic.oup.com/hsw/article-abstract/44/4/232/5610107>; Siegel M, Solomon B, Knopov A, Rothman EF, Cronin SW, Xuan Z, Hemenway D. The impact of state firearm laws on homicide rates in suburban and rural areas compared to large cities in the United States, 1991-2016. *Journal of Rural Health* 2020; 36(2):255-265. <https://onlinelibrary.wiley.com/doi/10.1111/jrh.12387>.

<sup>5</sup> Throughout this declaration, the term “large capacity magazine” or “LCM” will refer to an ammunition magazine with a capacity of more than 10 rounds.

and (c) state laws that eliminate the Charleston loophole<sup>6</sup> are effective in reducing firearm violence.

### **METHODOLOGY**

12. I utilized a standard methodology for assessing the impact of public policies on the public's health. My evaluation involved a totality of the evidence approach whereby I consider all of the studies related to the effectiveness of firearm-related laws and policies. In using the totality of the evidence approach, I also used what is called a weight of evidence approach. This means that different pieces of information are given different weights in my overall conclusions depending on how much useful information they add, which depends in part on the rigor of the study, the limitations, the strengths, and also on the study sample size or statistical power.

13. After reviewing the public health and scientific literature related to this case, I have formed the expert opinions which follow, which I hold to a reasonable degree of medical and scientific certainty, and which are based on my training and experience as a physician, epidemiologist, and public health expert using the same type of analyses used in my practice of epidemiology and public health and in composing my published work.

### **OPINIONS**

#### **I. Bans on Large Capacity Ammunition Magazines**

14. To address this issue, I reviewed three lines of scientific evidence: (1) evidence related to whether use of large capacity magazines ("LCMs") results in more fatalities in mass shooting events; (2) evidence related to the actual effect of these bans in reducing the utilization

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<sup>6</sup> The Charleston loophole is the provision in federal law that allows a firearm retailer to transfer a purchased gun to the buyer after 72 hours even if the federal background check has not yet been completed. Prior to Measure 114, Oregon law also allowed a firearm retailer to transfer a purchased gun to the buyer even if a background check had not been completed after a period.

of LCMs in mass shootings; and (3) studies of the impact of LCM bans on the incidence and severity of mass shootings.

**A. There is Strong Evidence that the Use of Large Capacity Magazines Increases the Number of Fatalities in Mass Shooting Events**

15. The conceptual basis behind restricting the capacity of ammunition magazines as an approach to reducing the mortality from mass shootings is that large capacity magazines “increase the ability to fire large numbers of bullets without having to pause to reload. Any measure that can force a pause in an active shooting—creating opportunities for those in the line of fire to flee, take cover, or physically confront a gunman—offers a possibility of reducing the number of victims in such an attack.”<sup>7</sup> Conceptually, restricting the capacity of ammunition magazines is more likely to be effective than banning assault weapons because as defined, “assault weapons” are not functionally different from other semiautomatic firearms, but they are typically equipped with high-capacity magazines.<sup>8</sup> Moreover, large-capacity ammunition magazine bans affect a much larger number of firearms because there are a substantial number of semiautomatic weapons that do not meet the definition of an assault weapon but that do accept large-capacity magazines.

16. Criminologist Christopher Koper from the Center for Evidence-Based Crime Policy at George Mason University explains the conceptual framework behind the utility of large capacity magazine bans in limiting deaths from mass shootings as follows: “In the broadest sense, AW–LCM [assault weapon-large capacity magazine] laws are intended to reduce gunshot

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<sup>7</sup> Klarevas, L., Conner, A., & Hemenway, D. (2019). The effect of large capacity magazine bans on high-fatality mass shootings, 1990–2017. *American Journal of Public Health*, 109, 1754–1761. <http://dx.doi.org/10.2105/AJPH.2019.305311>, p. 1,761.

<sup>8</sup> Koper, C. S. (2020). Assessing the potential to reduce deaths and injuries from mass shootings through restrictions on assault weapons and other high-capacity semiautomatic firearms. *Criminology & Public Policy*, 19, 147–170. <http://dx.doi.org/10.1111/1745-9133.12485>.

victimizations by limiting the stock of semiautomatic firearms with large ammunition capacities and, to a lesser degree, other features conducive to criminal use. Although offenders blocked from access to AWs and LCMs can commit crimes with other guns and smaller magazines, the logic underlying AW–LCM laws is that forcing this substitution should limit the number of shots fired in gun attacks, thus, reducing the number of people shot per attack and/or the number sustaining multiple wounds.”<sup>9</sup>

17. This conceptual framework is supported by abundant empirical evidence that fatality counts in mass shootings are higher when a large-capacity magazine is used by an assailant. During the period 2009-2016, nearly 20% of mass shootings involved firearms equipped with a large-capacity magazine,<sup>10</sup> whereas 67% of high-fatality mass shootings (i.e., events with more than five fatal victims) during the period 2006-2015 involved a large-capacity magazine.<sup>11</sup> An analysis of ATF crime gun trace data derived from 145 firearm mass murder events revealed that: “The identified AW [assault weapon] and LCM [large capacity magazine] cases typically occurred in public locations (80%) and resulted in more than twice as many people shot on average as did other incidents (13.7 victims on average for AW-LCM cases versus 5.2 for other cases; t test p level < 0.01).”<sup>12</sup> Koper et al. concluded that: “Estimates for firearm mass murders are very imprecise due to lack of data on the guns and magazines used in these cases, but available information suggests that AWs and other high capacity semiautomatics

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<sup>9</sup> Koper, 2020, p. 149.

<sup>10</sup> Koper, C. S., Johnson, W. D., Nichols, J. L., Ayers, A., & Mullins, N. (2018). Criminal use of assault weapons and high capacity semiautomatic firearms: An updated examination of local and national sources. *Journal of Urban Health*, 95, 313–321. <http://dx.doi.org/10.1007/s11524-017-0205-7>.

<sup>11</sup> Klarevas, L. (2016). *Rampage Nation: Securing America from Mass Shootings*. Amherst, NY: Prometheus Books.

<sup>12</sup> Koper et al., 2018, p. 318.



are involved in as many as 57% of such incidents. Further, they are particularly prominent in public mass shootings and those resulting in the highest casualty counts.”<sup>13</sup> Similarly, Webster et al. concluded that: “Indeed, recent studies have documented that fatal mass shootings committed with assault weapons and/or LCMs result in significantly more victims shot than is the case in such shootings which involved no assault weapons or LCMs.”<sup>14</sup> Koper also agrees with this point, stating: “High-capacity semiautomatics (which include assault weapons as a subset) are used in between 20% and 58% of all firearm mass murders, and they are used in a particularly high share of public mass shootings. Mass shootings perpetrated with these firearms result in substantially more fatalities and injuries than do attacks with other firearms, and these differences are especially pronounced for the number of victims with nonfatal gunshot injuries.”<sup>15</sup> Koper concludes: “attacks with semiautomatic firearms—including AWs and other guns equipped with LCMs—tend to result in more shots fired, more persons wounded, and more wounds inflicted per victim than do attacks with other firearms ... .”<sup>16</sup>

18. Many other studies support this conclusion that mass shootings perpetrated with large-capacity magazines result in more casualties than attacks committed without this type of ammunition device.<sup>17</sup> For example, Koper reported data showing an average of 13 victims hit in

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<sup>13</sup> Koper et al., 2018, p. 319.

<sup>14</sup> Webster, D. W., McCourt, A. D., Crifasi, C. K., Booty, M. D., & Stuart, E. A. (2020). Evidence concerning the regulation of firearms design, sale, and carrying on fatal mass shootings in the United States. *Criminology & Public Policy*, 19, 171–212. <http://dx.doi.org/10.1111/1745-9133.12487>, p. 173.

<sup>15</sup> Koper, 2020, p. 147.

<sup>16</sup> Koper, 2020, p. 149.

<sup>17</sup> See: (a) Koper, C. S. (2004). *An updated assessment of the Federal Assault Weapons Ban: Impacts on gun markets and gun violence, 1994–2003* (Report to the National Institute of Justice). Philadelphia: Jerry Lee Center of Criminology, University of Pennsylvania.

(b) Everytown for Gun Safety Support Fund. (2023). *Mass shootings in America: 2009-2022*. New York: Everytown for Gun Safety Support Fund.

mass shootings involving non-LCM firearms compared to 29 victims hit in mass shootings involving LCM firearms.<sup>18</sup> Everytown for Gun Safety reported that out of its database of mass shootings: “Mass shootings involving a high-capacity magazine resulted in an average of 10 people killed and 16.9 people wounded per shooting, compared to 4.6 people killed and 1.1 people wounded when smaller magazines were used.”<sup>19</sup> Everytown defined mass shootings as any shooting with more than three deaths excluding the perpetrator. It derived its database by systematically searching newspaper articles in real time as events occurred. The researchers requested police and court records for every event. Cannon reported an average of 9.7 fatalities and 20.5 casualties in mass shootings involving a large-capacity magazine, compared to an average of 5.8 fatalities and 8.8 casualties in mass shootings not involving a large-capacity magazine.<sup>20</sup> Dillon, analyzing data from the *Mother Jones* database of mass shootings, reported an average of 10.2 deaths and 22.6 casualties in mass shootings involving a large-capacity magazine, compared to 6.4 deaths and 9.9 casualties in mass shootings that did not involve a large-capacity magazine.<sup>21</sup> *Mother Jones* defined mass shootings as those occurring in a public place and not involving the commission of another crime and resulting in at least three deaths excluding the perpetrator. It described its methodology as “drawing on scores of news reports,

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(c) Cannon, A. (2018). *Mayhem multiplied: Mass shooters and assault weapons*. New York: Citizens Crime Commission of New York City.

(d) Dillon, L. (2013). *Mass shootings in the United States: An exploratory study of the trends from 1982–2012* (Master’s thesis). Fairfax: Department of Criminology, Law and Society, George Mason University.

(e) Blau, B. M., Gorry, D. H., & Wade, C. (2016). Guns, laws, and public shootings in the United States. *Applied Economics*, 48(49), 4732–4746.

<sup>18</sup> Koper, 2004.

<sup>19</sup> Everytown for Gun Safety Support Fund, 2023.

<sup>20</sup> Cannon, 2018.

<sup>21</sup> Dillon, 2013.

government documents and data, and interviews with law enforcement officials, legal experts, mental health professionals, and mass shooting victims.”<sup>22</sup> Blau et al., analyzing a multi-source database of mass shootings characterized as “active shooting events,” reported that events involving a large-capacity magazine resulted in a 47% increase in the number of fatalities and 61% increase in the number of victims.<sup>23</sup> The databases used were the Stanford Mass Shootings of America (MSA) data project, the Global Terrorism Database, a compiled data set by Follman, Aronson, and Pan (2012), and the Department of Justice’s study on active shooter incidence in the United States. Mass shootings were defined as those occurring in a public place by a single gunman and resulting in at least four fatalities.

19. It could be argued that in the absence of using a firearm equipped with a large-capacity magazine, a perpetrator could simply use multiple guns and achieve the same number of shots fired. However, this idea has been debunked.<sup>24</sup> Dr. Koper explains that this explanation simply does not square with the empirical data:

“Others have also reported that victim differentials associated with the use of LCM firearms or semi-automatics more generally persist even when accounting for the use of multiple firearms (Blau, Gorry, & Wade, 2016; Jager et al., 2018; Klarevas, 2016). To

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<sup>22</sup> Follman M. Why mass shootings deserve deeper investigation. Mother Jones. January 30, 2013. <https://www.motherjones.com/politics/2013/01/mass-shootings-james-alan-fox/>.

<sup>23</sup> Blau et al., 2016.

<sup>24</sup> “Although evaluating these arguments fully will require more in-depth analyses of the dynamics of mass shooting incidents (and perhaps near mass shooting incidents as well), available data and analyses do not provide obvious support for the multiple gun/multiple magazine substitution hypothesis, at least not with respect to the use of multiple guns. For example, in Koper et al.’s (2018) collection of mass firearm murders resulting in four or more deaths, cases in which shooters used multiple non-LCM guns averaged 5.3 fatalities and 7.2 total victims killed or wounded—averages substantially less than those for attacks with LCM firearms (regardless of number), especially for the total victim counts (see Table 2). Similarly, multiple gun cases without LCMs documented in the February 2019 version of the Mother Jones media organization’s data on public firearm mass murders (4+ killed; Follman et al., 2019) resulted in substantially fewer victims killed and wounded than did cases with LCM firearms; averages killed were 7.2 for multiple non-LCM firearm cases and 10.0 for LCM cases (excluding the Las Vegas incident), whereas averages for the total killed and wounded were 11.4 for multiple gun non-LCM cases and 21.3 for LCM cases (excluding the Las Vegas incident).” From Koper, 2020, p. 154.

illustrate, data reported by Klarevas (2016, pp. 221–224) show that ‘gun massacres’ (defined as incidents with six or more fatalities) committed with multiple non-LCM firearms average 7.2 victims killed (calculated by the author from the Klarevas figures), whereas LCM cases average 9.5 victims killed overall ... and 11.2 victims killed when multiple guns are used that include an LCM firearm. As a final illustration, [plaintiffs’ witness Dr. Gary] Kleck’s compilation of shots fired estimates for a sample of 25 mass shootings that resulted in six or more victims killed or wounded from 1994 to 2013 shows that cases involving LCM firearms averaged at least 134 shots on average in comparison with ~26 shots on average for cases involving multiple non-LCM firearms (calculated from Kleck, 2016, p. 43).”<sup>25</sup>

Thus, Plaintiffs’ own data demonstrate that the use of multiple non-LCM firearms does not result in the same number of shots fired as with a single LCM weapon.

20. Dr. Kleck examined news accounts of 23 mass shootings and concluded that in only one of these could the perpetrator have been stopped by bystander intervention when he tried to reload.<sup>26</sup> While this study is unreliable because it relies only on news reports and is just a small sample of mass shootings, the point is moot anyway because there are multiple cases in which a shooter pausing to reload was precisely the factor that led to the saving of lives by allowing time for potential victims to escape. Giffords Law Center to Prevent Gun Violence has documented at least two such cases: (a) “The 2011 mass shooting in Tucson, AZ, where six people were killed and 13 others were wounded, including US Representative Gabrielle Giffords, was interrupted when the gunman stopped to reload his weapon and was tackled by a bystander”;

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<sup>25</sup> Koper, 2020, pp. 154-155.

<sup>26</sup> Kleck G. Large-capacity magazines and the casualty counts in mass shootings: The plausibility of linkages. *Justice Research and Policy* 2016; 17(1):28-47.

and (b) “Similarly, during the 2018 shooting at Marjory Stoneman Douglas High School, students were able to escape down a stairwell while the shooter paused to reload his weapon.”<sup>27</sup>

21. Dr. Kleck tried to downplay the importance of the many lives that were saved by bystander intervention in the Giffords shooting by arguing that the shooter was not reloading but that his magazine was defective, so that the use of a large capacity magazine was of no consequence.<sup>28</sup> Nevertheless, he himself has made the argument that even if that were the case, the use of a large capacity magazine as his first magazine allowed a higher number of shots to be fired and that had a low capacity magazine been used, many lives would have been saved. Dr. Kleck stated: “The real significance of LCM use in the Gabrielle Giffords shooting is that the first magazine that the shooter used had a capacity of 33 rounds, and the shooter fired 31 times before being tackled. Had he possessed only a 15-round magazine, and bystanders were willing to intervene when the shooter either reloaded or struggled with a defective magazine, he would have been able to fire at most 16 rounds (including one in the firing chamber)—15 fewer than the 31 he actually fired before he was stopped, for whatever reason. Consequently, instead of the 19 people he shot (6 fatally, 13 nonfatally), it would be reasonable to estimate that he would have shot only about half as many victims. Thus, the absence of an LCM might have prevented three killings and six or seven nonfatal gunshot woundings in this incident.”<sup>29</sup> In the final analysis, Dr. Kleck admitted that there are indeed plausible scenarios in which the availability of a large capacity ammunition magazine could result in a higher number of fatalities and injuries in

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<sup>27</sup> Giffords Center to Prevent Gun Violence. Large capacity magazines. <https://giffords.org/lawcenter/gun-laws/policy-areas/hardware-ammunition/large-capacity-magazines/>. Accessed 10 Jan 2023.

<sup>28</sup> Declaration of Gary Kleck. In: Oregon Firearms Federation, Inc., et al. v. Kate Brown, et al. United States District Court, District of Oregon, Pendleton Division, January 6, 2023.

<sup>29</sup> Kleck, 2016, p. 40.

a mass shooting. Even if the shooter is halted because of a malfunction rather than the need to reload, the number of shots that have already been fired is in part determined by the ammunition capacity of the magazines that have been used up to that point in time. In short, there is strong, real-life evidence that large capacity magazine use has been associated with an increased death toll in mass shootings. Combined with the abundant scientific evidence presented above, there is no valid basis to question the conceptual foundation for the proposition that banning large capacity magazines is likely to reduce casualties in a mass shooting event.

22. One final argument that Dr. Kleck makes in an attempt to obscure the abundant scientific evidence that the use of large capacity magazines results in a greater number of casualties in a mass shooting event is that the association between large-capacity magazine use and higher casualty counts is due not to the use of the large-capacity magazine, but to the motivation of the perpetrator who uses such a device.<sup>30</sup> Dr. Kleck speculates that perpetrators who use a large-capacity magazine are more highly motivated to kill more people. This is pure speculation. There is not a shred of data or scientific evidence to support such an assertion. In public health, we base our arguments on data and scientific evidence, not on pure speculation.

23. Moreover, even if this speculation were to be true, it would add an additional reason why a large-capacity magazine ban would reduce casualties in mass shootings, rather than support a reason why such a ban would have no effect. If highly motivated shooters—those perpetrators who are most likely to try to shoot a large number of people—are unable to obtain large-capacity magazines, the result will be that despite their motivations, they will be less sure about their ability to kill as many people because under Dr. Kleck’s speculative assumptions,

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<sup>30</sup> Declaration of Gary Kleck. In: Oregon Firearms Federation, Inc., et al. v. Kate Brown, et al. United States District Court, District of Oregon, Pendleton Division, January 6, 2023.

perpetrators **believe** that higher magazine capacity will allow them to shoot more people. And if this is a widespread belief, as it would have to be for Dr. Kleck's assertion to be correct, then eliminating large capacity magazines could exert a protective effect by diverting potential shooters whose plans are derailed when they find that a large-capacity magazine is unavailable.

**B. There is Strong Evidence that Bans on Large-Capacity Magazines Result in a Reduction in the Utilization of these Devices in Crimes Generally and Mass Shootings Specifically**

24. Koper et al. demonstrated a dramatic increase in the proportion of crime guns that were equipped with large capacity magazines in the decade following the expiration of the federal assault weapon and large-capacity magazine ban, with increases of 48.6% in Chicago, 11.5% in Richmond, 49.4% in Minneapolis, and 33.6% nationally.<sup>31</sup> They concluded that: “Importantly, trend analyses suggest that LCM firearms have grown substantially as a share of crime guns since the expiration of the federal ban on AWs and LCMs.”<sup>32</sup> In another study, Koper came to the same conclusion: “The federal ban on assault weapons and large-capacity (>10 rounds) ammunition magazines of 1994 had exemptions and loopholes that limited its short-term effects, but its expiration in 2004 was followed by an increase in the use of these weapons in mass shootings and other crimes.”<sup>33</sup> In quantitative terms, Koper estimates the impact of the expiration of the federal large-capacity magazine ban as follows: “high-capacity semiautomatics have grown by as much as 112% as a share of crime guns since the expiration of the federal ban.”<sup>34</sup>

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<sup>31</sup> Koper et al., 2018.

<sup>32</sup> Koper et al., 2018, p. 319.

<sup>33</sup> Koper, 2020, p. 147.

<sup>34</sup> Koper, 2020, p. 150.

**C. There is Strong Evidence that State Laws that Ban Large-Capacity Magazines are Effective in Reducing the Number of Deaths from Mass Public Shootings**

25. The two lines of evidence presented in sections I and II of this disclosure actually are sufficient to conclude that large-capacity magazine bans will reduce fatalities associated with mass shootings. The first line of evidence establishes that when large capacity magazines are used in mass shootings, they result in a significantly higher number of fatalities. The second line of evidence establishes that when bans on large-capacity magazines are repealed, these types of ammunition devices are used much more frequently in mass shootings. Thus, combining these two lines of evidence, it is inarguably the case that the enactment of large-capacity magazine bans will reduce fatalities from mass shootings. Nevertheless, it is still important to examine a third line of evidence: studies that directly measure the impact of state large-capacity magazine bans on the number of fatalities that occur in mass shootings.

26. For this evaluation, I reviewed all studies in the peer-reviewed literature that analyzed the impact of state-level bans on large-capacity magazines on the incidence or severity of mass public shootings.<sup>35</sup> The relevant studies are summarized in Table A.

27. The early research in this area focused on assessing the impact of the 1994 federal ban on assault weapons and large-capacity ammunition magazines but led to conflicting results.<sup>36</sup> It is important to note that these studies of the federal assault weapon and large-capacity ammunition magazine ban are difficult to interpret and of very limited value because of the

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<sup>35</sup> The term “incidence” refers to the likelihood of a mass public shooting occurring in the first place, while the term “severity” refers to the number of fatalities when such an event does occur.

<sup>36</sup> Morral, A. R., Ramchand, R., Smart, R., et al. *The Science of Gun Policy: A Critical Synthesis of Research Evidence on the Effects of Gun Policies in the United States*. Santa Monica, CA: Rand Corporation; 2018. [https://www.rand.org/pubs/research\\_reports/RR2088.html](https://www.rand.org/pubs/research_reports/RR2088.html).



absence of a comparison group. Therefore, there is limited evidence upon which to identify the counterfactual (i.e., what would have occurred in the absence of the law). More recently, research has focused on studying the effects of state firearm laws, which allows multiple group or panel study designs because there is indeed a wide variation in the adoption of firearm laws across states and across time. Unlike the studies of the national law, these studies of state laws have robust comparison groups and rigorous research designs that allow conclusions to be drawn. My analysis therefore focuses on these studies.

**Table A: Studies Examining the Effectiveness of State-Level Large Capacity Ammunition Magazine Bans on the Incidence and Severity of Mass Public Shootings**

Study and years covered; Number of events	Firearm laws examined	Key findings
Gius, 2015 <sup>37</sup> (1982-2011); 57 events	State assault weapon bans (most of which were accompanied by large-capacity magazine bans)	The presence of a state assault weapons ban was associated with a statistically significant <sup>38</sup> 45% reduction in the number of mass shooting fatalities.
Blau et al., 2016 <sup>39</sup> (1982-2015); 184 events	State assault weapon bans (similar to Gius, most of these laws were accompanied by large-capacity magazine bans).	The presence of a state assault weapons ban significantly decreased the incidence of mass shootings.
Klarevas et al., 2019 <sup>40</sup> (1990-2017); 69 events	State large-capacity magazine bans	The presence of a large-capacity magazine ban was associated with a non-statistically significant 72% reduction in the incidence of high-fatality mass shootings (more than five victim deaths) and a non-significant

<sup>37</sup> Gius, M. (2015). The impact of state and federal assault weapons bans on public mass shootings. *Applied Economics Letters*, 22, 281–284. <http://dx.doi.org/10.1080/13504851.2014.939367>.

<sup>38</sup> Statistical significance relates to the probability that a LCM ban could be found to reduce mass shooting fatalities even if there were no true effect. If this probability is less than 5%, then the result is said to be “statistically significant.”

<sup>39</sup> Blau, B. M., Gorrry, D. H., & Wade, C. (2016). Guns, laws, and public shootings in the United States. *Applied Economics*, 48(49), 4732–4746.

<sup>40</sup> Klarevas, L., Conner, A., & Hemenway, D. (2019). The effect of large capacity magazine bans on high-fatality mass shootings, 1990–2017. *American Journal of Public Health*, 109, 1754–1761. <http://dx.doi.org/10.2105/AJPH.2019.305311>.

		decrease in the number of fatalities in a high-fatality mass shooting.
Webster et al., 2020 <sup>41</sup> (1984-2017); 604 events	State large-capacity magazine bans	The presence of a state large-capacity magazine ban was associated with a statistically significant 48% reduction in the incidence of mass shootings and a non-statistically significant 70% reduction in the number of mass shooting fatalities. For domestic-related mass shootings, <sup>42</sup> these laws were associated with a significant 61% reduction in incidence and a significant 75% reduction in the number of fatalities.
Siegel et al., 2020 <sup>43</sup> (1976-2018); 155 events	State large capacity ammunition magazine bans	The presence of a state ban on large capacity ammunition magazines was associated with a non-significant 56% reduction in the incidence of a mass public shooting and a significant 38% reduction in the number of fatalities in a mass public shooting (the estimate for a negative binomial model instead of a zero-inflated model was 37%).

28. Study #1: Professor Mark Gius of the Department of Economics at Quinnipiac University published a study in 2014 in the journal *Applied Economics Letters*.<sup>44</sup> Dr. Gius obtained data on the number of mass shootings by state from the *Mother Jones* database of mass shootings and from the FBI's Supplementary Homicide Reports for the period 1982-2011. *Mother Jones* defined mass shootings as those occurring in a public place and not involving the commission of another crime and resulting in at least three deaths excluding the perpetrator. The FBI defined mass shootings as any event in which at least four people are murdered with a gun. There were a total of 57 public mass shooting events identified during this time period. Using a

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<sup>41</sup> Webster, D. W., McCourt, A. D., Crifasi, C. K., Booty, M. D., & Stuart, E. A. (2020). Evidence concerning the regulation of firearms design, sale, and carrying on fatal mass shootings in the United States. *Criminology & Public Policy*, 19, 171–212. <http://dx.doi.org/10.1111/1745-9133.12487>.

<sup>42</sup> Domestic mass shootings are those involving the shooting of multiple family members.

<sup>43</sup> Siegel M, Goder-Reiser M, Duwe G, Rocque M, Fox JA, Fridel EE. The Relation Between State Gun Laws and the Incidence and Severity of Mass Public Shootings in the United States, 1976–2018. *Law and Human Behavior* 2020; 44(5):347-360.

<sup>44</sup> Gius, 2014.

Poisson two-way fixed effects model with fixed effects for year and state, Gius examined the relationship between the presence of a state or federal ban on assault weapons<sup>45</sup> and the number of mass shooting fatalities in each state, while weighting for state population and controlling for a range of state-level factors. The major finding of the paper was that state bans on assault weapons were associated with a significant 45% reduction in the number of mass shooting deaths. Gius concluded as follows: “These results indicate that fatalities due to mass shootings were lower during both the federal and state assault weapons ban periods. Although some prior research has shown either that assault weapons bans did not reduce crime or that they actually increased gun-related murder rates (Gius, 2014), the present study’s focus on mass shootings shows the effectiveness of these gun control measures in reducing murders due to mass shootings.”<sup>46</sup> It should be kept in mind that the observed effects in this study might be due to an effect of large-capacity magazine bans rather than to assault weapon bans themselves.

29. Study #2: In 2016, Blau and colleagues from Utah State University published a paper in the journal *Applied Economics*.<sup>47</sup> Analyzing a database of mass shooting events, the authors conducted a probit regression analysis which revealed that the presence of a state assault weapons ban significantly reduced the incidence of mass shootings. As with the Gius study, this

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<sup>45</sup> The federal ban on assault weapons is contemporaneous with the federal ban on large capacity ammunition magazines. At the state level, most—though not all—states that implemented assault weapons bans also implemented large-capacity magazine restrictions at the same time. The only discrepancies during the time period of this study were California, which implemented an assault weapons ban in 1989 but did not ban large-capacity magazines until 2000; Connecticut, which implemented an assault weapons ban in 1993 but did not ban large-capacity magazines until 2013; and Maryland, which implemented a large-capacity magazine ban in 1994 but did not ban assault rifles until 2013. Because assault weapon bans have consistently been found not to reduce the incidence of mass shootings, the observed effects in this study are most likely attributable to large-capacity magazine bans and because of non-differential misclassification bias, they likely underestimate the true effect of such bans.

<sup>46</sup> Gius, 2014, p. 3.

<sup>47</sup> Blau et al., 2016.

research is limited because it assessed state assault weapons bans, not large-capacity magazine bans. But because assault weapon bans have consistently been found not to reduce the incidence of mass shootings, the observed effects in this study are most likely attributable to large-capacity magazine bans and because of non-differential misclassification bias, they likely underestimate the true effect of such bans. The databases used were the Stanford Mass Shootings of America (MSA) data project, the Global Terrorism Database, a compiled data set by Follman, Aronson, and Pan (2012), and the Department of Justice's study on active shooter incidence in the United States. Mass shootings were defined as those occurring in a public place by a single gunman and resulting in at least four fatalities.

30. Study #3: Professor Louis Klarevas and colleagues published a study in 2019 in the *American Journal of Public Health*.<sup>48</sup> They used a wide variety of newspapers, federal data sets, and crowdsourced databases to identify high-fatality mass shootings that occurred during the period 1990-2017. They defined high-fatality mass shootings as events in which there were at least six fatalities, not including the perpetrator. They identified a total of 69 such events. They examined the effect of both the federal and state bans on large-capacity magazines. The outcome variables were the incidence of high-fatality mass shootings in a state in a given year and the number of fatalities resulting from high-fatality mass shootings in that state in that year, modeled using a Poisson regression and a negative binomial regression, respectively. State fixed effects were included along with a continuous linear time trend and a wide range of state-level control variables. State population was controlled for in all analyses. Examining the joint effects of the federal and state bans on large-capacity magazines, the authors reported that these laws were associated with a significant 72% reduction in the incidence of high-fatality mass shootings and a

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<sup>48</sup> Klarevas et al., 2019.

significant reduction in the number of deaths per mass shooting. When examining the independent effects of state bans only, the regression coefficients were nearly the same although they were no longer statistically significant. The lack of statistical significance here is unlikely to be important because the regression coefficients were unchanged. Thus, the lack of statistical significance likely reflects a low sample size. Therefore, the authors concluded that: “LCM [large capacity magazine] bans appear to reduce both the incidence of, and number of people killed in, high-fatality mass shootings.”<sup>49</sup>

31. Study #4: In 2020, Professor Daniel Webster and colleagues from the Center for Gun Research and Policy at the Johns Hopkins Bloomberg School of Public Health published a paper in the journal *Criminology and Public Policy*.<sup>50</sup> The authors used the FBI’s Supplementary Homicide Report as well as a range of crowdsourced databases to identify fatal mass shootings occurring during the period 1984-2017. Mass shootings were defined broadly and included all fatal shooting events with four or more victim deaths. They identified a total of 604 incidents. Using negative binomial regression models with the state population as the exposure variable, the authors modeled the number of mass shootings as well as the number of deaths per mass shooting as a function of the presence or absence of a state ban on large-capacity magazines, state fixed effects, linear and quadratic year trends, and a range of state-level control variables. They reported results separately for all mass shootings and for domestic-related mass shootings. The presence of a state large-capacity magazine ban was associated with a statistically significant 48% reduction in the incidence of mass shootings and a non-statistically significant 70% reduction in the number of mass shooting fatalities. For domestic-related mass shootings,

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<sup>49</sup> Klarevas et al., 2019, p. 1754.

<sup>50</sup> Webster et al., 2020.

these laws were associated with a significant 61% reduction in incidence and a significant 75% reduction in the number of fatalities. The authors concluded as follows: “This study identified two policies associated with reductions in fatal mass shootings—laws requiring firearm purchasers or owners to acquire a license that involves in-person application and/or fingerprinting of applicants and state laws banning the purchase of LCMs or ammunition-feeding devices for semiautomatic firearms. The size of the estimated protective effects of these two policies are striking, although there are large confidence intervals.”<sup>51</sup>

32. Study #5: My colleagues and I published a paper in the journal *Law and Human Behavior* in 2020.<sup>52</sup> The research team was funded by the National Institute of Justice to develop the most comprehensive database to date of mass public shootings, defined as mass shooting events in public places occurring outside a private residence and outside the setting of other crimes.<sup>53</sup> We assembled the database using a variety of sources in an attempt to capture all events and then researched each event in detail to identify those that met our predetermined definition of a mass public shooting. We utilized all publicly available mass shooting databases as well as non-published databases of which we were aware. There were multiple coders and interrater reliability was assessed and showed very good agreement between coders. A total of 155 events were identified. We used a generalized estimating equations logistic regression to examine the relationship between eight state firearm laws and the likelihood of a mass public shooting. We then used a zero-inflated negative binomial model to assess the relationship

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<sup>51</sup> Webster et al., 2020, p. 187.

<sup>52</sup> Siegel et al., 2020.

<sup>53</sup> Specifically, the term “mass public shooting” was defined as an event in which four or more strangers are killed in a public location absent other criminal activity. The specific criteria used to define a mass public shooting are as follows: (a) at least four of all victims were killed by gunfire; (b) at least four of the victims were killed in a public place or else at least half of all fatalities occurred in a public place; and (c) the shooting did not occur in a private residence, although those that occurred in a nonprivate residence (e.g., group home or motel) were retained.

between these laws and the number of fatalities and nonfatal injuries in these incidents. We found that the presence of a state ban on large-capacity magazines was associated with a non-significant 56% reduction in the incidence of a mass public shooting and a significant 38% reduction in the number of fatalities in a mass public shooting (the estimate for a negative binomial model instead of a zero-inflated model was 37%). We also found that large-capacity magazine bans were associated with a significant 70% reduction in the number of non-fatal injuries when a mass shooting event occurs. Assault weapon bans themselves had no association with either the incidence or severity of mass shootings. Large-capacity magazine bans were the only state firearm law found to significantly reduce the number of fatalities and non-fatal injuries in a mass shooting. We concluded that: “Laws requiring permits to purchase a gun are associated with a lower incidence of mass public shootings, and bans on large-capacity magazines are associated with fewer fatalities and nonfatal injuries when such events do occur.”

33. In summary, there are five studies that examined the effectiveness of state-level bans on large-capacity magazines in reducing the incidence or severity of mass shootings. All five studies provide evidence that these laws reduce both the incidence and severity of mass shootings. In some cases, the results are not statistically significant. However, this is likely due to the small number of events. The magnitude of the observed effects in all four studies are quite large: 48% to 72% reductions in the incidence of mass shootings and 37% to 75% reductions in the number of fatalities when a mass shooting occurs. The statistical significance of these large observed associations is greatest in the study which defined mass shootings most broadly to include domestic-related shooting events. These effect sizes are the largest that are present in the entire scientific literature on the impact of state firearm laws and make it unlikely that chance,

bias, or confounding can explain the observed findings of these studies. There is also remarkable consistency and robustness in the findings.

#### **D. Conclusion**

34. Based on this review of the literature, including a review of the conceptual foundation for restricting the capacity of ammunition magazines, the demonstration of a direct link between large-capacity magazine bans and the decreased use of these devices in mass shootings, and empirical evidence of a decrease in the incidence and severity of mass public shootings associated with state-level bans, I conclude that state-level bans on large-capacity magazines are effective in reducing fatalities due to public mass shootings.

#### **II. State Laws that Require State Permits for the Purchase and Possession of Firearms are Effective in Reducing Firearm Violence, Both from Firearm Homicide Generally and from Mass Public Shootings**

35. For this evaluation, I reviewed all studies in the peer-reviewed literature that analyzed the impact of state-level gun permit requirements on firearm homicide rates. The relevant studies are summarized in Table B.

**Table B: Studies Examining the Effectiveness of State Gun Permit Requirements in Reducing Firearm Homicide Rates**

<b>Study and years covered</b>	<b>Measure of state firearms laws</b>	<b>Outcome</b>
Liu, Siegel, and Sen, 2022 <sup>54</sup> (2000-2019)	State-level permit requirements	State permit requirements were associated with significantly lower rates of firearm homicide. Firearm homicide rates in a state were higher if neighboring states failed to have a permit requirement.

<sup>54</sup> Liu Y, Siegel M, Sen B. Association of state-level firearm-related deaths with firearm laws in neighboring states. *JAMA Network Open* 2022; 5(11):e2240750. <https://doi.org/10.1001/jamanetworkopen.2022.40750>.



Siegel, Goder-Reiser, et al., 2020 <sup>55</sup> (1976-2018)	State-level permit requirements	Permit requirements were significantly associated with 40% reduction in the incidence of mass public shootings
Webster et al., 2020 <sup>56</sup> (1984-2017)	State-level permit requirements	Permit requirements were significantly associated with 56% reduction in the incidence of mass shootings
McCourt et al., 2020 <sup>57</sup> (1985-2017)	State-level permit requirements in Connecticut and Missouri	Permit requirements were associated with a significantly lower firearm homicide rates (rates decreased by 28% in Connecticut after implementation of law; rates increased by 47% in Missouri after repeal of law)
Knopov et al., 2019 <sup>58</sup> (1991-2016)	State-level permit requirements	Permit requirements were associated with an 18% reduction in firearm homicide rates among both the White and Black populations
Siegel et al., 2019 <sup>59</sup> (1991-2016)	State-level permit requirements	Permit requirements were associated with a 20% reduction in

<sup>55</sup> Siegel M, Goder-Reiser M, Duwe G, Rocque M, Fox JA, Fridel EE. The relation between state gun laws and the incidence and severity of mass public shootings in the United States, 1976-2018. *Law and Human Behavior* 2020; 44(5):347-360. <https://content.apa.org/record/2020-78672-001>.

<sup>56</sup> Webster, D. W., McCourt, A. D., Crifasi, C. K., Booty, M. D., & Stuart, E. A. (2020). Evidence concerning the regulation of firearms design, sale, and carrying on fatal mass shootings in the United States. *Criminology & Public Policy*, 19, 171–212. <http://dx.doi.org/10.1111/1745-9133.12487>.

<sup>57</sup> McCourt, Crifasi CK, Stuart EA, et al. Purchaser licensing, point-of-sale background check laws, and firearm homicide and suicide in 4 US states, 1985-2017. *American Journal of Public Health* 2020; 110(10):1546-1552. <https://ajph.aphapublications.org/doi/epdf/10.2105/AJPH.2020.305822>.

<sup>58</sup> Knopov A, Rothman EF, Cronin SW, Xuan Z, Siegel M, Hemenway D. Impact of state firearm laws on homicide rates among the Black and White populations in the United States, 1991-2016. *Health and Social Work* 2019; 44(4):232-240. <https://academic.oup.com/hsw/article-abstract/44/4/232/5610107>.

<sup>59</sup> Siegel M, Solomon B, Knopov A, Rothman EF, Cronin SW, Xuan Z, Hemenway D. The impact of state firearm laws on homicide rates in suburban and rural areas compared to large cities in the United States, 1991-2016. *Journal of Rural Health* 2020; 36(2):255-265. <https://onlinelibrary.wiley.com/doi/10.1111/jrh.12387>.

		firearm homicide rates in both urban and non-urban areas
Crifasi et al., 2018 <sup>60</sup> (1984-2015)	State-level permit requirements	Permit requirements were associated with a 14% reduction in firearm homicide rates in urban counties
Rudolph et al., 2015 <sup>61</sup> (1984-2005)	Enactment of permit to purchase law in Connecticut (compared before and after trends with those in 39 control states)	Implementation of law was associated with a 40% reduction in firearm homicide rate
Webster et al., 2014 <sup>62</sup> (1999-2012)	Repeal of purchase to permit law in Missouri (compared before and after trends with all other states)	Repeal of law was associated with a 23% increase in firearm homicide rate
Lester and Murrell, 1982 <sup>63</sup> (1960, 1970)	State restrictions on purchase of handguns (scale of 0-7)	No significant relationship between state laws in 1968 and firearm homicide rates in 1970
Sommers, 1980 (1977) <sup>64</sup>	State handgun licensing requirement	Licensing associated with a significant decrease in homicide rates

36. Study #1: I am a co-author of a paper published in 2022 in *JAMA Network*

*Open*.<sup>65</sup> In this study, we examined not only whether state gun permitting laws are associated

<sup>60</sup> Crifasi CK, Merrill-Francis M, McCourt A, Vernick JS, Wintemute GH, Webster DW. Association between firearm laws and homicide in urban counties. *J Urban Health* 2018; 95:383-390. <https://link.springer.com/article/10.1007/s11524-018-0273-3>; Crifasi CK, Merrill-Francis M, McCourt A, Vernick JS, Wintemute GH, Webster DW. Correction to: Association between firearm laws and homicide in urban counties. *J Urban Health* 2018; 95(5):773-776. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6181823/>.

<sup>61</sup> Rudolph KE, Stuart EA, Vernick JS, Webster DW. Association between Connecticut's permit-to-purchase handgun law and homicides. *American Journal of Public Health* 2015; 105(8):e49-e54. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4504296/>.

<sup>62</sup> Webster DW, Crifasi DK, Vernick JS. Effects of repeal of Missouri's handgun purchaser licensing law on homicides. *J Urban Health* 2014; 91(2):293-302. <https://link.springer.com/article/10.1007/s11524-014-9865-8>.

<sup>63</sup> Lester D, Murrell ME. The preventive effect of strict gun control laws on suicide and homicide. *Suicide and Life-Threatening Behavior* 1982; 12:131-140.

<sup>64</sup> Sommers PM. Deterrence and gun control: An empirical analysis. *Atlantic Economic Journal* 1980; 8:89-94.

<sup>65</sup> Liu et al., 2022.

with lower firearm homicide rates in a given state, but also whether the presence or absence of permitting laws in neighboring states affects the firearm homicide rate in a given state. We modeled firearm homicide rates in the 48 contiguous states between 2000 and 2019. We used a spatial autoregressive model with fixed effects for state and year in order to investigate within-state, interstate, and overall associations between 9 types of state firearm laws and firearm homicide rates. Only one law was found to have a significant effect on firearm homicide rates within a state and in neighboring states: state permit requirement laws. State permitting laws were found to be associated with significantly lower firearm homicide rates in states that had those laws in place. In addition, if neighboring states failed to have a permitting law, it was associated with an increase in firearm homicide in adjacent states. Thus, the presence of contiguous states, all having state permitting laws, had a powerful influence in lowering firearm homicide rates in all of the involved states. We concluded that: “Our findings suggest that having a permit requirement for purchasing all firearms was associated with a decrease of any firearm-related death and firearm-related homicide within state, interstate, and overall. ... Particularly, our findings suggest that permit-to-purchase laws, which research finds to be protective against within-state firearm-related deaths, are also protective for neighboring states, suggesting that more restrictions on the eligibility of obtaining a gun also discourage out-of-state persons from buying firearms from those states.”<sup>66</sup>

37. Study #2: I am lead author of a paper published in 2020 in the journal *Law and Human Behavior*.<sup>67</sup> The research team was funded by the National Institute of Justice to develop the most comprehensive database to date of mass public shootings, defined as mass shooting

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<sup>66</sup> Liu et al., 2022, p. 7.

<sup>67</sup> Siegel et al., 2020.

events in public places occurring outside a private residence and outside the setting of other crimes.<sup>68</sup> A total of 155 events were identified. We used a generalized estimating equations logistic regression to examine the relationship between eight state firearm laws and the likelihood of a mass public shooting. We then used a zero-inflated negative binomial model to assess the relationship between these laws and the number of fatalities and nonfatal injuries in these incidents. We found that the presence of a state gun permitting law was associated with a significant 60% reduction in the likelihood of a mass public shooting occurring. There was no association between permit laws and the number of fatalities or non-fatal injuries when a mass shooting did occur. Permitting laws were the only state firearm law that was found to be significantly associated with reductions in the incidence of mass shootings. We concluded that: “We found a robust relationship between state laws that require permits for the purchase and/or possession of guns and the incidence of mass public shootings...”<sup>69</sup>

38. Study #3: In 2020, Professor Daniel Webster and colleagues from the Center for Gun Research and Policy at the Johns Hopkins Bloomberg School of Public Health published a paper in the journal *Criminology and Public Policy*.<sup>70</sup> The authors used the FBI’s Supplementary Homicide Report as well as a range of crowdsourced databases to identify fatal mass shootings occurring during the period 1984-2017. Mass shootings were defined broadly and included all fatal shooting events with four or more victim deaths. They identified a total of 604 incidents. Using negative binomial regression models with the state population as the exposure variable,

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<sup>68</sup> Specifically, the term “mass public shooting” was defined as an event in which four or more strangers are killed in a public location absent other criminal activity. The specific criteria used to define a mass public shooting are as follows: (a) at least four of all victims were killed by gunfire; (b) at least four of the victims were killed in a public place or else at least half of all fatalities occurred in a public place; and (c) the shooting did not occur in a private residence, although those that occurred in a nonprivate residence (e.g., group home or motel) were retained.

<sup>69</sup> Siegel et al., 2020, p. 354.

<sup>70</sup> Webster et al., 2020.

the authors modeled the number of mass shootings as well as the number of deaths per mass shooting as a function of the presence or absence of a state ban on large-capacity magazines, state fixed effects, linear and quadratic year trends, and a range of state-level control variables. They reported results separately for all mass shootings and for domestic-related mass shootings. The presence of a state permitting law was significantly associated with a 56% reduction in the incidence of all mass shootings. These laws were not associated with the incidence of domestic-related mass shootings. The authors concluded as follows: “This study identified two policies associated with reductions in fatal mass shootings—laws requiring firearm purchasers or owners to acquire a license that involves in-person application and/or fingerprinting of applicants and state laws banning the purchase of LCMs or ammunition-feeding devices for semiautomatic firearms. The size of the estimated protective effects of these two policies are striking, although there are large confidence intervals.”<sup>71</sup>

39. Study #4: In a study published in 2020 in the *American Journal of Public Health*, McCourt and colleagues examined the effect of the adoption of a handgun permit law in Connecticut as well as the effect of the repeal of a handgun permit law in Missouri on firearm homicide rates.<sup>72</sup> The authors used the synthetic controls method, which compared firearm homicide rates in Connecticut and Missouri to those in other states that had comparable pre-intervention trends. Connecticut’s permit to purchase law went into effect in 1995; firearm homicide trends in Connecticut were examined from 1985 through 2017. Missouri’s permit to purchase law was repealed in 2007; firearm homicide trends in Missouri were examined from 1997 through 2016. The authors found that the enactment of Connecticut’s permit-to-purchase

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<sup>71</sup> Webster et al., 2020, p. 187.

<sup>72</sup> McCourt et al., 2020.

law was significantly associated with a 28% reduction in firearm homicide rates, while the repeal of Missouri's law was significantly associated with a 47% increase in firearm homicide rates.

The authors concluded that: "Purchaser licensing laws coupled with CBC [comprehensive background check] requirements were consistently associated with lower firearm homicide and suicide rates, but CBC laws alone were not."<sup>73</sup>

40. Study #5: In 2019, Knopov et al. (including myself and members of my research team) published a paper in *Health and Social Work* that examined the association between a variety of state firearm laws and homicide rates separately among the White and Black population during the period 1991-2016.<sup>74</sup> We used a difference-in-differences approach, modeling homicide rates in each state during each year with year and state fixed effects and a range of state-level control variables. We found that permit requirements were associated with significantly lower overall homicide rates for both the White and Black populations and estimated the magnitude of the association to be an 18% reduction. We concluded that state permit requirement laws "were associated with lower homicide rates among both White and Black populations..."<sup>75</sup> Permit laws were associated only with firearm homicide rates, not with non-firearm homicide rates.

41. Study #6: In 2019, Siegel et al. published a paper in the *Journal of Rural Health* that examined the association between a variety of state firearm laws and homicide rates separately among the urban and non-urban population of the United States during the period 1991-2016.<sup>76</sup> We used a difference-in-differences approach, modeling homicide rates in each

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<sup>73</sup> McCourt et al., 2020, p. 1546.

<sup>74</sup> Knopov et al., 2019.

<sup>75</sup> Knopov et al., 2019, p. 232.

<sup>76</sup> Siegel et al., 2019.

state during each year with year and state fixed effects and a range of state-level control variables. We found that permit requirements were associated with significantly lower firearm homicide rates for both the urban and non-urban populations and estimated the magnitude of the association to be a 20% reduction. We concluded that: “Permit requirements were associated with lower firearm homicide rates in both large cities and smaller localities.”<sup>77</sup> Permit laws were associated with reductions both in firearm homicide rates and overall homicide rates.

42. Study #7: In 2018, Crifasi and colleagues published an analysis of the relationship between a range of state firearm laws and rates of firearm homicide among 136 large, urban counties in the United States during the period 1984-2015.<sup>78</sup> The panel data were analyzed using mixed effects Poisson regression with random intercepts for counties and year fixed effects, and the models controlled for both state and county characteristics known to be associated with violence. The authors found that state gun permit laws were significantly associated with a 14% reduction in firearm homicide in these large, urban counties. They conclude: “These findings are consistent with prior research at the state level showing PTP [permit-to-purchase] laws are associated with decreased firearm homicide. Testing the effects of PTP laws specifically in large, urban counties strengthens available evidence by isolating the effects in the geographic locations in which firearm homicides concentrate.”<sup>79</sup>

43. Study #8: Rudolph and colleagues estimated the effect of Connecticut’s handgun permit law which was enacted in 1995.<sup>80</sup> Using synthetic control methods, the authors compared trends in firearm homicide rates in Connecticut from before to after the law to contemporaneous

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<sup>77</sup> Siegel et al., 2019, p. 262.

<sup>78</sup> Crifasi et al., 2018 and Crifasi et al., 2018 (correction).

<sup>79</sup> Crifasi et al., 2018, p. 383.

<sup>80</sup> Rudolph et al., 2015.

trends in 39 other states without permit-to-purchase laws. Trends were examined for 10 years prior to the enactment of Connecticut's law and 10 years after the law's enactment. The authors reported that Connecticut's handgun permit law was significantly associated with a 40% reduction in firearm homicide rates. The authors concluded: "Consistent with prior research, this study demonstrates that Connecticut's handgun purchaser licensing law is associated with a subsequent reduction in homicide rates. As would be expected if the reduction is driven by the law, the policy's effects are only evident for homicides committed with firearms."<sup>81</sup>

44. Study #9: In this study, Webster and colleagues examined the impact of the **repeal** of Missouri's handgun permit law in 2007 on trends in firearm homicide rates in Missouri compared to all other states during the period 1999-2012.<sup>82</sup> The authors used a difference-in-differences approach with state and year fixed effects and controlled for a wide range of state-level factors. The primary finding was that the repeal of Missouri's handgun permit law was significantly associated with a 23% **increase** in firearm homicide rates. However, there was no effect on non-firearm homicide rates. The authors concluded: "Our estimates suggest that the law was associated with an additional 55 to 63 murders per year in Missouri between 2008 and 2012 than would have been forecasted had the PTP [permit-to-purchase] law not been repealed."<sup>83</sup>

45. Study #10: In 1982, Lester and Murrell published an article in the journal *Suicide and Life-Threatening Behaviors* that examined the relationship between the status of eight state handgun-related laws in 1968 and homicide rates in those states in 1970.<sup>84</sup> This was therefore a cross-sectional study with only one year of data and no opportunity to examine trends in

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<sup>81</sup> Rudolph et al., 2015, p. e49.

<sup>82</sup> Webster et al., 2014.

<sup>83</sup> Webster et al., 2014, p. 298.

<sup>84</sup> Lester and Murrell, 1982.



homicide rates over time. The study found no significant association between state permitting laws in 1968 and their homicide rates in 1970. The authors conclude that no effect of “strict handgun control laws was found for mortality from homicide by firearms.”<sup>85</sup>

46. Study #11: In 1980, Sommers published an article in the *Atlantic Economic Journal* that presented a cross-sectional analysis of the relationship between the presence or absence of a state gun permitting law in 1977 and murder rates during the same year.<sup>86</sup> Controlling for a wide range of state-level factors, the author found a significant negative relationship between state gun permitting laws and homicide rates. The author concluded that gun licensing “has a deterrent effect on murder but not on robbery.”<sup>87</sup>

47. In total, I identified 11 studies that examined the effectiveness of state-level gun permit requirements. Of these, 10 (all but one) found a significant reduction in firearm homicide associated with state permitting laws. In 9 of the studies, state permit requirements were found to reduce overall rates of firearm homicide. In 2 studies, state permit requirements were found to reduce the incidence of public mass shootings. In these studies, permit requirements were the only state law found to be associated with a lower incidence of mass public shootings. The only negative study of the 11 was old and was cross-sectional and therefore unable to examine trends in homicide over time; it was published in 1982 and was based on the status of state laws in 1968, which is before the enactment of most of the existing state permitting laws.

48. Based on this review of the literature, there is overwhelming evidence that state-level gun permitting laws are effective in reducing rates of firearm homicide. My own research, consisting of three different published studies, found a consistent reduction of between 18% and

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<sup>85</sup> Lester and Murrell, 1982, p. 131.

<sup>86</sup> Sommers, 1980.

<sup>87</sup> Sommers, 1980, p. 89.

20% in firearm homicide rates associated with state-level permit requirements, and also found a 40% reduction in the incidence of mass public shootings that was associated with these state permitting laws. These studies are the most recent and comprehensive studies to date and use the most rigorous analytic techniques (*i.e.*, difference-in-differences analysis). Our results are consistent with those of other studies. Webster et al. (2020) found a 56% reduction in mass shootings associated with state gun permit laws. Studies from other research groups found between a 14% and a 47% reduction in firearm homicide rates associated with gun permitting laws. Thus, the results of these studies are consistent and robust. The magnitude of the observed associations is large. It is unlikely that chance, bias, or confounding could explain these large and consistent associations. I conclude that there is therefore strong evidence of a causal relationship between gun permitting laws and reductions in the rate of overall and firearm homicide.

49. There is strong evidence that background checks conducted through a gun permitting process are more effective than stand-alone background checks conducted at point-of-sale without a permit requirement.<sup>88</sup> This is likely because permitting involves a more intensive and localized examination of an applicant's criminal history and is more likely to pick up disqualifying misdemeanor offenses than a federal background check.<sup>89</sup> Thus, I conclude that not only do state permitting laws reduce overall and firearm homicide, but they also help to enhance the background check system that is in place in all states.

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<sup>88</sup> Crifasi CK, McCourt AD, Webster DW. *The Impact of Handgun Purchaser Licensing on Gun Violence*. Baltimore, MD: Johns Hopkins Bloomberg School of Public Health, Center for Gun Policy and Research; 2019. [https://www.jhsph.edu/research/centers-and-institutes/johns-hopkins-center-for-gun-violence-prevention-and-policy/\\_docs/impact-of-handgun-purchaser-licensing.pdf](https://www.jhsph.edu/research/centers-and-institutes/johns-hopkins-center-for-gun-violence-prevention-and-policy/_docs/impact-of-handgun-purchaser-licensing.pdf).

<sup>89</sup> Sumner SA, Layde PM, Guse CE. Firearm death rates and association with level of firearm purchase: An explanatory study. *American Journal of Preventive Medicine* 2012; 55:346-350. [https://www.ajpmonline.org/article/S0749-3797\(08\)00310-3/fulltext](https://www.ajpmonline.org/article/S0749-3797(08)00310-3/fulltext).

### III. State Laws that Close the Charleston Loophole are Effective in Preventing Gun Violence

50. In 2015, there was a tragic mass shooting of nine African-American people who were worshipping at the Emanuel AME Church in Charleston, South Carolina. The perpetrator of this crime was not legally eligible to purchase a gun because of a history of unlawful drug use. However, because his background check was not processed within three days, he was allowed to obtain possession of the gun before the background check was completed. He then used that gun to commit the mass shooting. This loophole in federal law, which allows guns to be transferred after 72 hours have transpired if a background check has not yet been completed, is now known as the “Charleston loophole.”

51. It is estimated that about 3% of federal NICS background checks take longer than 72 hours to complete.<sup>90</sup> The number of illegal purchasers who are able to obtain guns because of the Charleston loophole is substantial. In 2019, the FBI reported that a total of 2,989 prohibited purchasers were able to obtain guns illegally because of the Charleston loophole.<sup>91</sup> However, this is a conservative estimate because it only counts purchasers for whom a background check was eventually completed. In 2019, the FBI failed to complete background checks on 79% of cases in which the background check took longer than 72 hours.<sup>92</sup> The FBI itself has recommended that the three-day period be extended to allow its agents the necessary time to

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<sup>90</sup> Criminal Justice Information Services Division of the Federal Bureau of Investigation, U.S. Department of Justice. *National Instant Criminal Background Check System (NICS) Operations 2019*. <https://www.fbi.gov/file-repository/2019-nics-operations-report.pdf>.

<sup>91</sup> Criminal Justice Information Services Division of the Federal Bureau of Investigation, U.S. Department of Justice. *National Instant Criminal Background Check System (NICS) Operations 2019*. <https://www.fbi.gov/file-repository/2019-nics-operations-report.pdf>.

<sup>92</sup> Criminal Justice Information Services Division of the Federal Bureau of Investigation, U.S. Department of Justice. *National Instant Criminal Background Check System (NICS) Operations 2019*. <https://www.fbi.gov/file-repository/2019-nics-operations-report.pdf>.

complete background checks and to prevent guns from illegally getting into the hands of prohibited buyers who may pose a danger to the public.<sup>93</sup>

52. There is no question that it is in the interest of protecting public safety for the state to close this severe loophole by extending the amount of time that the Department of State Police has to conduct background checks before the gun is released to the purchaser. Based on the known effects the loophole at the federal level, we know that the loophole has resulted, at a minimum, in one tragic mass public shooting in which nine people were killed. Therefore, I conclude that there is strong evidence that closing the Charleston loophole would have a substantial effect on reducing gun violence in Oregon.

I declare under penalty of perjury that the foregoing is true and correct.

Dated this 6th day of February, 2023.

s/Michael Siegel  
Dr. Michael Siegel

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<sup>93</sup> U.S. General Accounting Office. Gun Control: *Implementation of the National Instant Criminal Background Check System* 13 (Feb. 2000). <https://www.ojp.gov/ncjrs/virtual-library/abstracts/gun-control-implementation-national-instant-criminal-background>.